

Integrating psychosocial and WASH school interventions to build disaster resilience

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ABSTRACT

This paper reviews the key disaster risk management (DRM) frameworks used for protecting children's wellbeing in disaster settings and identifies a lack of consideration for (1) psychosocial and (2) water, sanitation and hygiene (WASH) needs. It also demonstrates that these two domains are meaningfully linked, as access to adequate WASH provision may protect psychosocial wellbeing and promote community resilience. As support in both domains is vitally important to children's wellbeing, these gaps warrant immediate attention. Schools are uniquely situated to support these needs as part of disaster risk management and resilience building. Therefore, we consider the ASEAN Common Framework for Comprehensive School Safety (ACFCSS), which is an adaptation of the Comprehensive School Safety Framework (CSS) implemented in schools across the ASEAN region. While the CSS explicitly considers WASH, it only briefly considers psychosocial support; the ACFCSS lacks consideration of both domains. We argue revisions of the ACFCSS should prioritise the inclusion of psychosocial and WASH support and consider the role of schools beyond their capacity as educational institutions. We present an adaptation of ACFCSS with an additional framework pillar to guide this revision. Overall, we advocate for an integrated approach to DRM in schools based on an evidence-based, interdisciplinary perspective. We provide a series of evidence-based recommendations for DRM frameworks to consider, especially for those that intend to safeguard the wellbeing of children.

1. Introduction

In the wake of disasters, children are among the most vulnerable for developing psychological trauma [1–4]. Multiple frameworks have been proposed to support the disaster preparedness, response and recovery of children and communities following natural hazard events. However, these frameworks lack emphasis and guidance concerning psychosocial needs and needs pertaining to water, sanitation and hygiene (WASH). This paper examines the importance of integrating psychosocial support and access to WASH services in disaster risk reduction (DRR). DRR is a

systematic approach to assessing and reducing risk, with the purpose of minimising vulnerabilities, mitigating the adverse impacts of natural hazards and facilitating sustainable development [5].

The paper gives novel consideration to how WASH and psychosocial support intersect in relation to disasters. We propose that access to psychosocial support and WASH services be included explicitly in existing disaster risk management (DRM) frameworks. DRR and resilience in low-/middle-income nations prone to natural hazard events, such as the Association of Southeast Asian Nations (ASEAN) region, would benefit immensely from improved frameworks. It is this region's DRM that this paper addresses in particular, especially concerning the

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List of frequent acronyms and abbreviations

AADMER	ASEAN Agreement on Disaster Management and Emergency Response (Guide)
ACFCSS	ASEAN Common Framework for Comprehensive School Safety (Framework)
ASEAN	Association of Southeast Asian Nations
BBB	Build Back Better (Framework/Guide)
CSS	Comprehensive School Safety (Framework)
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
GADRRRES	Global Alliance for Disaster Risk Reduction and Resilience in the Education Sector
GFDRR	Global Facility for Disaster Reduction and Recovery
GPSS	Global Program for Safer Schools (Framework)

INEE	International Network for Education in Emergencies
INEE MS	INEE Minimum Standards in Education (Framework)
PTSD	Post-traumatic stress disorder
SDG(s)	Sustainable Development Goal(s)
WASH	Water, Sanitation and Hygiene
WISS	Worldwide Initiative for Safer Schools (Framework)

Other Acronyms and Abbreviations

CBT	Cognitive-behavioural therapy
CBTS	Community-Based Total Sanitation
EDMR	Eye movement desensitization and reprocessing
JMP	Joint Monitoring Program
JSPADM III	ASEAN-UN Joint Strategic Plan of Action on Disaster Management (Guide)
KIDNET	Narrative exposure therapy for children

wellbeing of children in seismic hazard zones.

The literature identifies schools as vital centres of support for children and their communities following a hazard event [6–8]. Resilience building and disaster recovery are facilitated through a system of processes that exist to buffer the impact of disasters, or improve circumstances during or afterwards, including short-term responses and long-term planning [9,10]. While there is no cross-disciplinary consensus on what resilience means [11], the Intergovernmental Panel on Climate Change [12] defines resilience as the ability of a social system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organisation and the capacity to adapt to stress and change. Drawing on the SPHERE Handbook for humanitarian response (2018), the International Network for Education in Emergencies (INEE) Strategic Framework 2018–2023 (2018) [114] and the INEE Minimum Standards in Education [13], we propose an integrated approach to DRR and resilience-building through schools. The goal of this paper is to build on existing frameworks in the ASEAN region, particularly the *ASEAN Common Framework for Comprehensive School Safety* [14,112] to explicitly include the psychosocial and WASH gaps in the ACFCSS impact children's experiences before, during and after disasters. This broadening of scope may result in better school preparedness practices and improved child and hence community resilience.

This paper begins by providing a literature review exploring the psychosocial impact of disasters on the wellbeing of children and communities, the role of WASH in DRM and its links to psychosocial resilience. A review of core DRM frameworks is then presented; this section specifically considers which components should inform the revision of the ACFCSS, which is presently composed of three pillars that do not explicitly include psychosocial interventions or WASH access. Based on this review, the paper then discusses the implications of such revisions for the ACFCSS. A practical solution for moving towards a more integrated approach is presented by proposing an adapted version of the ACFCSS with an additional pillar. The paper concludes by exploring the implications of this additional pillar and offering recommendations for future research and applications of the adapted framework.

2. Literature review

2.1. Psychosocial impact of disasters on children and psychosocial interventions

There is a significant body of knowledge demonstrating the effects of disasters on children. Common mental health problems associated with disasters are anxiety, depression and post-traumatic stress disorder (PTSD; [15,16], though there is currently no exact programme or tool for improving psychosocial or mental health preparedness regarding

disasters [17]. Studies on disaster preparedness and post-disaster recovery often lack adequate consideration of psychological wellbeing and its impact as these domains are often oversimplified (or entirely omitted) in DRM frameworks [16]. Thus, there is a need to design and establish a plan to help communities prepare and cope with emotional issues when facing disaster events [18]; see also [19]. Though some research has explored mental distress in children and youth in relation to disaster recovery (e.g. Refs. [20–22], little is known about the long-term mental health impacts of disasters [15]. This section considers the psychosocial and mental health impact of disasters on children, where 'psychosocial wellbeing' refers to the connection between individual psychological aspects (thoughts, emotions and behaviours) and collective social aspects (relationships, traditions and culture) that are central to positive human functioning but which are often disrupted by traumatic events [23].

Recent empirical studies emphasise the need for psychosocial support in disaster recovery and preparedness strategies. Murphy et al. [24] found a large proportion of survivors from eight humanitarian interventions identified mental health as an essential component of individual and collective resilience, and reported psychosocial support as the most valued component of disaster response in a quarter of the sites. Post-disaster studies report that unmitigated psychological disturbances can cause severe consequences in the daily lives of children, especially as children facing disasters often experience extreme changes in their mood, behaviour, development, memory and decision-making [2,16]. Disasters also have the potential to exacerbate existing or underlying mental health issues across the family unit, which can accentuate the vulnerability of children and introduce potential for neglect [25]. The literature documents specific examples of the problems this can cause in hazard-affected communities, such as increases in domestic violence post-disaster [26].

The use of psychosocial interventions for children experiencing trauma in this context has been examined in several studies. Two recent meta-analyses by Brown et al. [27] and Newman et al. [28] found that mental health interventions were significantly more effective than natural recovery in minimising PTSD symptoms, and identified a series of variables that may moderate the effectiveness of the interventions: individual vs group, intervention setting, providers' level of training, parental involvement, age and length of therapy. These reviews emphasise the need for the intervention to occur as soon as possible after the disaster to protect children's psychosocial wellbeing. They also emphasise that informal, group-based interventions are as effective as formalised approaches (e.g., Cognitive Behaviour Therapy, Eye Movement Desensitization and Reprocessing), which is important to note as resources are often scarce post-disaster, and group interventions can be facilitated with several children at once by a single, trained individual (see Ref. [29]).

Group-based approaches may also be ideal for attending to children's complex psychological needs in disaster recovery contexts. Children often exhibit complex presentations of trauma-related stress disorders [30], which may be overlooked when administering individualised treatment but would be addressed in wide-spread group interventions. For example, Math et al. [31] found community-based group interventions were the most beneficial interventions for primary, secondary and tertiary children survivors¹ of the tsunami in the Andaman and Nicobar Islands (India) in mitigating adjustment disorder, depression and panic disorder. Group-based therapies have been shown to effectively address a series of related issues (e.g., anxiety, panic disorders, depression) in children and other groups (adolescents, adults, elderly), and provide essential components of psychosocial rehabilitation (e.g., Refs. [32,33]). Group interventions are especially effective in supporting children's psychosocial needs in disaster contexts when they offer wide-spread support to various individuals in children's complex social worlds who may also need psychosocial support (e.g., friends, peers, community members [25,34,35]; foster a sense of belonging and an improved sense of self-worth, respect and competence in children, (e.g.) through group-play [36], and in adults (e.g., Ref. [37]). They also foster lower attrition rates as children are less likely to drop out of group treatments than individual sessions [38].

However, there are many well-documented barriers to supporting the psychosocial wellbeing of children who experience potentially traumatic events, including disasters. A review of the psychological impact of disasters on children highlights that the most significant challenge to supporting their psychosocial needs is that children often do not report their psychological reactions to a trauma or a disaster unless specifically asked [2]. Even when asked, children may struggle to convey their complex feelings and emotions, which they may lack both the vocabulary and life experience to describe [39]. Kar [2] argues that children are not often given the opportunity to discuss their feelings because of assumed 'cognitive immaturity' (i.e., too young to grasp the significance of traumatic events). Though children may struggle to understand and verbalise their experiences and needs, it is critical to provide them with a safe space to discuss their psychological health; children are often willing to discuss their experiences when given the opportunity. This has been corroborated by studies in other areas of trauma, such as bereavement [40] and personal traumatic memories [41].

2.2. Considering the unique position of schools in supporting the needs of children and communities

Schools are uniquely situated to support children's psychosocial needs, given their resources (e.g., teachers, staff, space, facilities) and context as institutions that serve as the centres of their communities and as the primary institutions which support children's education (see Refs. [42–46]). Education in emergencies provides immediate physical and psychosocial protection and life-saving knowledge and skills (e.g., concerning disease prevention, self-protection and awareness of rights; see also, [47,48]). For example, schools in disaster-prone regions often provide vital DRR education directly to children through teachers. Disaster preparedness curricula, which include a psychosocial component, have been shown 'to better prepare children to deal with emotional reactions during and after disasters' [49]; p.124). Schoolchildren learn quickly and often become active agents of change [50]. Kar and Chambers [51] argue that schools and student activists have major potential to change the future in their communities.

Schools are also involved in local DRM and are ideal sites to facilitate psychosocial response, namely through group-based interventions. For example, a study of school-aged children in Hawaii who were exposed to hurricane Iniki showed that individual and group treatment by trained school counsellors was effective in reducing self-reported trauma-related symptoms [29]. Schools can also support the psychosocial wellbeing of children through group-based approaches using informal routes of engagement, such as play and sport [52]. Such activities stimulate intrinsic protective mechanisms that contribute to the child's resilience to distress (e.g., through informal social support, practice in managing emotions and self-control; [53,54]). However, appropriate training of coaches and facilitators impacts the effectiveness of such interventions, as sports, for example, are inherently neutral and require an informed coach to mould the activity to be therapeutic [52]. Schools are identified as ideal institutions to lead efforts in supporting children's psychosocial wellbeing, as children often experience various levels and waves of distress following a hazard-event [1,2] and schools can often facilitate these group-based therapeutic activities (see also, [7,8,55]). Psychosocial support systems can also support the majority of the school population (e.g., IASC, 2006).

Schools are known to be valuable resources in promoting resilience in disaster-affected communities as they provide trusted psychosocial and physical support to children, which often benefits the overall community [56–58]. Save the Children (i.e. [59]), argues that there is a need to train people in dealing with the portions of the population who suffer from loss and trauma associated with disasters and emergencies, as the number of post-disaster trauma victims requiring attention often exceeds the capacity that public mental health personnel can support. Schools are, therefore, ideal support sites because activities that serve to help teachers develop an understanding of how to interact with trauma-exposed children may foster a sensitivity that is vital to improving children's psychosocial circumstances over generations.

2.3. WASH, disaster risk management and resilience building

There is a consensus that good quality, accessible WASH facilities are critical in disaster contexts, to reduce the risk of transmission of communicable diseases and protect against mental health impacts [60–62]. The role of WASH and psychosocial recovery as part of post-disaster recovery and resilience-building remains largely under-researched. WASH is considered a human right [63]; WASH supports daily activities and basic needs such as personal hygiene, access to sanitation and water for both sanitary and hygiene purposes, and cooking [64]. A series of major international organisations highlight the importance of WASH in DRR and recovery. WHO [65]; UNDRR [66]; UNICEF [13], and UNDP et al. [67] each assert that WASH saves lives in emergencies and routine situations, and is a priority in response to emergencies. These organisations argue that providing WASH services helps people return to their normal daily activities after a disaster and that the main objective of WASH programmes in disasters is to reduce faecal-oral transmission of disease.

While SDG 6 [68] aims to ensure availability of water and sanitation for all by 2030, progress has been slow with 2.2 billion people lacking access to safe drinking water and 4.2 billion without access to safely managed sanitation [69]. Already vulnerable groups (children, elderly, poor) are at greater risk, with up to 15,000 children under the age of five dying of preventable causes, such as diarrhoea and pneumonia, everyday [70]. Data from schools also suggest that many students suffer from inadequate access to WASH [65]. Humanitarian crises, emergencies and disasters can place an additional burden on WASH infrastructure where it already exists but also presents an opportunity in places where it is missing. Krishnan [71] argues that disaster recovery offers an opportunity for communities to actively initiate and influence change in WASH implementation and behaviour in order to improve recovery action. Krishnan [71] also stresses that recovery programmes should take a holistic approach in order to meet community priorities

¹ "A primary survivor is one who was exposed directly to both the earthquake and the tsunami. A secondary survivor is one with close family and personal ties to primary survivors. Tertiary survivors include individuals from communities beyond the impact area, the majority of which were exposed to the earthquake only." [31]: 33).

and, through participation, should tackle issues around water supply, menstrual hygiene needs, privacy and security of WASH facilities, without neglecting the need for rebuilding physical structures, strengthening livelihood opportunities and aligning them with disaster preparedness and mitigation measures.

Lack of access to WASH can exacerbate the post-disaster consequences of affected populations and is vital for poverty reduction, especially for marginalised populations [72]. A study by Wanda et al. [73] reveals how the inadequacy of WASH provision experienced at the local level in communities affected by natural hazards and disasters is an issue that often stems from the mismanagement of WASH governance at the regional and national levels, especially the lack of WASH legal frameworks. The quality of services provided is also a concern. For example, the ASEAN Public Toilet Standards [74,75] state that public toilets need to be clean, dry, hygienic; located conveniently, well maintained, equipped with proper waste management systems; safe, private, accessible to the public and those with various needs (e.g., cultural, gendered, disabilities). Yet, in reality, many of the WASH facilities in selected signatory countries do not meet these criteria, including in schools [76]; see also [51]. Thus, concern for WASH implementation and maintenance is emphasised for post-disaster contexts, and further still regarding developing countries where local governance structures may be weak and adversely affected in times of crisis [77].

WASH should be considered a critical need and priority during emergencies and in post-disaster recovery efforts. These services are vital for building resilience to various types of unpredictable crises, such as natural hazards, armed conflict or global pandemics. This notion is reflected in the current context of a pandemic where lack of access to WASH services has been associated with a higher risk of COVID-19 spread [78] and has been a significant barrier to disaster recovery efforts (e.g., Refs. [79,80]). Prioritising WASH in early and longer-term stages of response is essential to building resilient communities, which are well-equipped for future hazards given their recurring nature [77]. There is also reason to believe WASH and psychosocial wellbeing are inherently linked (e.g., Refs. [81–83]).

2.4. Holistically considering DRM: realising the links between psychosocial support and WASH

WASH may have the potential to mitigate or exacerbate the consequences of the psychosocial dimensions of wellness - especially in the context of natural hazard events. For example, Parikh et al. [84] systematically analysed evidence (>500 publications) of synergies and trade-offs between improved sanitation and SDGs. They found that 'sanitation action is required to achieve all 17 SDGs' (p.13), including those concerned with psychosocial wellbeing and mental health. That is, Parikh et al. [84] demonstrate that WASH is directly linked to a series of experiential outcomes, including psychosocial wellbeing.

Studies across disciplines reflect that integrated psychosocial and WASH support is highly valued amongst disaster survivors. For example, Kawasaki et al. [57] surveyed 1557 parents and 145 teachers in Hiroshima, Japan, which is at high-risk of landslide disaster. They found 'a remarkably high' proportion of respondents were primarily concerned about both WASH provisions (i.e., bathroom conditions, hygiene management) and the mental health care of children. Likewise, an anthropological investigation by Stevenson and colleagues (2012) found water to be a source of psychological stress for those in communities with limited or difficult access to water due to practical challenges of water insecurity (e.g., having to reuse water, not being able to cook fresh meals, exposure to water-related illness from use of accumulated water sources, thirst and dehydration), and a series of psychosocial concerns such as shame at 'appearing unclean to others', 'wearing soiled clothes' or at 'being unable to fulfil normative expectations of hospitality' (p.397). Stevenson et al. [82] later expanded their investigation to find that water insecurity significantly predicted

psychological distress, even when controlling for food insecurity, socio-economic status and the quality of the previous year's harvest. Other social science studies have explicitly linked WASH to emotional distress marked by feelings of shame, anxiety, fear, worry, frustration, anger and enhanced vulnerability (e.g., Refs. [85–87]). Each of these studies also emphasises a gender difference, where women and girls are likely to be affected to a greater extent by water-insecurity due to the responsibilities of their culturally based gender roles (e.g., cooking, cleaning, washing; carer) and their own unique needs (e.g., regarding increased privacy and menstruation; [88]).

Further, the evidence base shows that emotional distress may be exacerbated by natural hazards that introduce additional WASH issues or worsen already difficult conditions of access or purity (e.g., Refs. [82, 89]). Worsened WASH conditions may contribute additional 'life stress', which has been empirically linked to a greater predisposition to develop PTSD, both before and after exposure to a traumatic event [90,91]. WASH scarcity has also been documented to engender interpersonal conflict in families and communities, including domestic violence and mistrust amongst neighbours (see Refs. [82,85,89]). Lack of social support is a major risk factor for developing post-traumatic stress disorder. Social support is especially important for protecting children [92,93], who are already especially vulnerable to developing post-traumatic stress symptoms following a disaster related to natural hazard events [94]. Schools may have the potential to moderate these effects by providing basic WASH provisions for children and families during times of need, such as safe drinking water, sanitary toilets and handwashing stations [95]. In addition to meeting the physical and social needs of their pupils and communities, schools with adequate WASH facilities should also have a sustained hygiene promotion programme to ensure holistic, long-term care which endures through all stages of disaster resilience, response and recovery phases [96].

While WASH is incorporated into some community-based DRR and preparedness frameworks (e.g., Build Back Better [BBB] [113], Comprehensive School Safety Framework [CSS]) [116], these provisions are still overlooked in the disaster management discourse (e.g., Sendai framework). A review by Lee et al. [16] identifies a series of gaps associated with the health- and disaster-focused SDGs. As the UNDESA SDGs [68] serve as the foundation for a series of major DRM frameworks, such gaps are increasingly significant and need to be remedied. The notion of WASH being explicitly linked to psychosocial resilience in disaster preparedness contexts is a gap, which this paper argues has not been explicitly acknowledged in the DRR frameworks, but which is central to DRM and resilience to natural hazards. As schools are valuable resources in the promotion of community-wide resilience and are primary institutions mitigating the effects of disasters on their communities and pupils, we argue that the DRM frameworks should address links between WASH and psychosocial resilience for children.

3. Psychosocial interventions and WASH in existing DRM, resilience and safety frameworks

3.1. Disaster risk reduction and management frameworks overview

While WASH services and psychosocial wellbeing play an important role in disaster preparedness, resilience building and post-disaster recovery, both in general and within schools, they are not included in existing frameworks in the ASEAN region, particularly the ACFSS. The omission of these domains jeopardises school-aged children's wellbeing regarding their physical safety and mental wellness. However, several international DRM and related frameworks offer insights into addressing this gap.

Table 1 outlines the major international DRR and DRM frameworks and highlights which include WASH access and psychosocial support. While some, such as BBB, do include them, they are either mentioned only briefly or are not considered in the disaster context explicitly. Even in the case of the United Nations' 2030 Agenda for Sustainable

Table 1
Main disaster risk reduction and management frameworks.

Creators & Audience	Aims & Focus	Format	Psychosocial Support?	WASH Support?
<p>Sendai Framework for Disaster Risk Reduction 2015–2030 (2015)</p> <p>Developed by: United Nations Office for DRR.</p> <p>Audience: Governments; Policymakers; International, regional and national DRM organisations; UN member states.</p>	<p>Successor of the <i>Hyogo Framework for Action 2005–2015: Building the Resilience of Nations and Communities to Disasters</i> (2005).</p> <p>Aims to achieve a substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries.</p> <p>Adoption of measures which address the three dimensions of disaster risk (exposure to hazards, vulnerability and capacity, and hazard's characteristics).</p>	<p>Priorities for Action:</p> <ol style="list-style-type: none"> 1 Understanding disaster risk. 2 Strengthening disaster risk governance to manage disaster risk. 3 Investing in disaster risk reduction for resilience. 4 Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction. 	<p><input checked="" type="checkbox"/> Yes, but only brief acknowledgement of psychosocial need. See, Priority 4: (33’) Enhance recovery schemes to provide psychosocial support and mental health services for all people in need.</p> <p><input checked="" type="checkbox"/> The terms ‘mental health’, and ‘psychosocial’ each appear only once; ‘psychological’ does not appear.</p>	<p><input checked="" type="checkbox"/> Water (briefly).</p> <p><input checked="" type="checkbox"/> The term ‘water’ appears only once; the terms ‘sanitation’ and ‘hygiene’ do not appear.</p>
<p>SPHERE Handbook for Humanitarian Response (2018 – Regularly Updated)</p> <p>Developed through an international collaboration of various humanitarian organisations.</p> <p>Audience: Governments; Policymakers; Military; International, regional and national DRM organisations; Practitioners involved in planning or implementing a humanitarian response; donors; private sector; survivors.</p>	<p>A universal guide for post-disaster and conflict contexts, disaster preparedness and resilience.</p> <p>Inform core humanitarian standards globally.</p> <p>Based on <i>The Humanitarian Charter</i>, 4 protection principles (e.g., Enhance safety, dignity, ensure access assistance, assist physical and psychological recovery, help people claim their rights) and the <i>Core Humanitarian Standard</i> (impartiality, humanity, independence, neutrality).</p>	<p>Sectors:</p> <ol style="list-style-type: none"> 1 Water supply, Sanitation and Hygiene. 2 Food Security and Nutrition. 3 Shelter and Settlement. 4 Health. 	<p><input checked="" type="checkbox"/> 1 Domain: Mental Health. See: Essential Concepts in Health, Mental Health.</p> <p><input checked="" type="checkbox"/> The terms ‘mental health’, ‘psychosocial’ and ‘psychological’ appear consistently throughout.</p>	<p><input checked="" type="checkbox"/> 6 Domains: Hygiene Promotion, Water Supply, Excreta Management, Vector Control, Solid Waste Management, WASH in Disease Outbreak and Healthcare Settings. See: <i>Essential Concepts in Water Supply, Sanitation and Hygiene promotion and Essential Concepts in Health</i>.</p> <p><input checked="" type="checkbox"/> The terms ‘water’, ‘sanitation’ and ‘hygiene’ appear consistently throughout.</p>
<p>Build Back Better (2018)</p> <p>Developed by: Global Facility for Disaster Reduction and Recovery (GFDRR).</p> <p>Audience: Governments; Policymakers; International DRM organisations; Practitioners involved in planning or implementing a humanitarian response; donors; private sector.</p>	<p>An <i>approach</i>, not framework.</p> <p>Follow-up to <i>Unbreakable</i> report [99]</p> <p>A steering principle, particularly for resilience-building and post-disaster recovery.</p>	<p>Dimensions:</p> <p>Build Back Stronger.</p> <p>Build Back Faster.</p> <p>Build Back More Inclusively.</p>	<p><input checked="" type="checkbox"/> No, though it is included in the <i>Unbreakable</i> report.</p> <p><input checked="" type="checkbox"/> The terms ‘mental health’, ‘psychological’, ‘psychosocial’ do not appear.</p>	<p><input checked="" type="checkbox"/> Yes (briefly). See: Resilient Recovery and Building Back Better.</p> <p><input checked="" type="checkbox"/> The terms ‘water’ and ‘sanitation’ each appear only thrice; ‘Hygiene’ does not appear.</p>
<p>Build Back Better in Recovery, Rehabilitation and Reconstruction (2017) [115]</p> <p>Developed by: United Nations International Strategy for Disaster Reduction (UNISDR)</p> <p>Audience: Governments; Policymakers; International DRM organisations; Practitioners involved in planning or implementing a humanitarian response; donors; private sector.</p>	<p>Supports Priority Four of the <i>Sendai Framework</i>: Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction.</p>	<p>Tasks from <i>Sendai Framework</i>:</p> <p>4b.1 Develop an all-stakeholder, national-level disaster recovery framework.</p> <p>4b.2 Enable pre-disaster recovery planning among all stakeholders.</p> <p>4b.3 Formalise Processes and systems to enable effective assessment of post-disaster damages and needs ... to formulate broad recovery strategies.</p> <p>4b.4 Institute or strengthen policies, laws, and programs that promote, guide, support BBB ... for [all stakeholders].</p>	<p><input checked="" type="checkbox"/> Yes, but only brief acknowledgement of psychosocial need. See: Responsibilities and Resources.</p> <p><input checked="" type="checkbox"/> The terms ‘mental health’ and ‘psychological’ do not appear; ‘psychosocial’ appears only twice.</p>	<p><input checked="" type="checkbox"/> Yes (briefly). See, Responsibilities and Resources.</p> <p><input checked="" type="checkbox"/> The term ‘sanitation’ appears only once; ‘water’ only thrice; ‘Hygiene’ does not appear.</p>
<p>Guide to Developing Disaster Recovery Frameworks (2015)</p> <p>Developed by: World Bank and GFDRR.</p> <p>Audience: Governments; Policymakers.</p>	<p>To enable a government to create a national disaster recovery framework.</p> <p>A practice-based guide offering options that can be adapted to an individual country's conditions.</p>	<p>6 Modules:</p> <ol style="list-style-type: none"> 1 Conducting Post-Disaster Damage and Needs Assessment. 2 Policy and Strategy Setting for Recovery. 3 Institutional Framework for Recovery. 4 Financing for Recovery. 	<p><input checked="" type="checkbox"/> No.</p> <p><input checked="" type="checkbox"/> The terms ‘mental health’, ‘psychological’, and ‘psychosocial’ do not appear.</p>	<p><input checked="" type="checkbox"/> Yes.</p> <p><input checked="" type="checkbox"/> The terms ‘water’, ‘sanitation’, and ‘hygiene’ appear throughout.</p>

(continued on next page)

Table 1 (continued)

Creators & Audience	Aims & Focus	Format	Psychosocial Support?	WASH Support?
2030 Agenda for Sustainable Development – Sustainable Development Goals (2015) Developed by: United Nations Department of Economic and Social Affairs (UNDESA) and UN member states. Audience: All stakeholders working towards global, sustainable development.	Supported by the Division for Sustainable Development Goals. Provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. Non-disaster specific.	5 Implementation Arrangements and Recovery Management. 6 Strengthening Recovery Systems in National and Local Governments.		
		17 Sustainable Development Goals (with 168 Targets): 1 No Poverty. 2 Zero Hunger. 3 Good Health and Wellbeing. 4 Quality Education. 5 Gender Equality. 6 Clean Water and Sanitation. 7 Affordable and Clean Energy. 8 Decent Work and Economic Growth. 9 Industry, Innovation and Infrastructure. 10 Reduced Inequalities. 11 Sustainable Cities and Communities. 12 Responsible Consumption and Production. 13 Climate Action. 14 Life Below Water. 15 Life on Land. 16 Peace, Justice and Strong Institutions. 17 Partnerships for the Goals	<input checked="" type="checkbox"/> Yes, but non-disaster specific. See (e.g.) SDG 3. <input checked="" type="checkbox"/> The term 'mental health' appears only twice; 'psychological', and 'psychosocial' do not appear.	<input checked="" type="checkbox"/> Yes, but non-disaster specific. See (e.g.) SDG 6. <input checked="" type="checkbox"/> The terms 'water' and 'sanitation' appear throughout. <input checked="" type="checkbox"/> The term 'hygiene' appears only twice.

Development (2015), which serves as the universal 'plan of action for people, planet and prosperity' (p. 5) and consistently re-affirms its aim of promoting disaster risk reduction, the connection between WASH practices and psychosocial wellbeing is not acknowledged, and psychosocial dimensions are not considered in depth.

Considering the ASEAN region specifically, a series of frameworks have been developed over time (see Fig. 1). The AADMER's objective was to support the existing and planned hazard-response initiatives by ASEAN Member States (i.e., Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam; [14]. AADMER (2009) [111] and ASEAN Vision 2025 [97] played

critical roles in the region's approach to DRM, but there is no mention of WASH or psychosocial support or interventions in the three strategic pillars that drive the response efforts through the frameworks. These gaps remain prevalent in the AADMER-WP (2016), which informed the ASEAN-UN JSPADM III [98]. Thus, the guidance for DRR and DRM in the ASEAN region does not explicitly include WASH or psychosocial considerations. Instead, the focus is on making the ASEAN a leader in the Worldwide Initiative for Safe Schools (WISS; 2015)[116,117] by following the guidelines outlined in the ACFCSS framework.

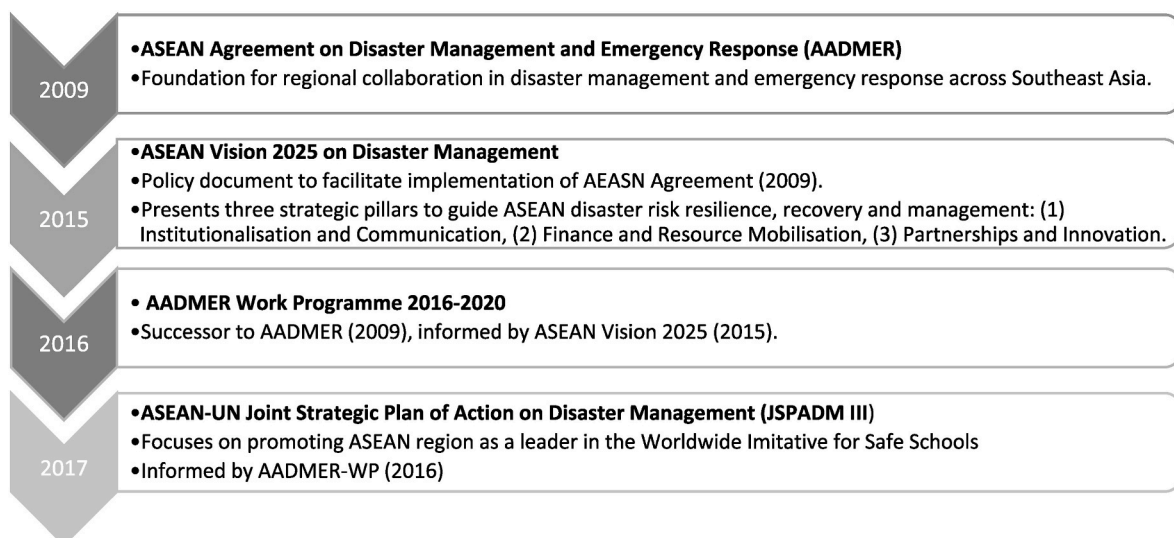


Fig. 1. Successive ASEAN disaster management frameworks for Southeast Asia.

3.2. Disaster risk reduction and management frameworks for education and school safety

Lack of identification of hazards and mitigation of risks in these institutions can lead to prolonged challenges in bringing children back to school post-disaster and recovering their full operation within the community; such outcomes can have detrimental, long-term effects on children's development [99]. Several additional frameworks and

initiatives help facilitate DRM in schools. The most widely used frameworks for the education sector in emergencies, disasters and recovery, are the INEE MS [13]; CSS (2017) developed in support of the Global Alliance for Disaster Risk Reduction and Resilience in the Education Sector (GADRRRES), and the WISS (2015) developed by GADRRRES and UNISDR. Table 2 presents a summary of the frameworks.

The CSS explicitly outlines schools' responsibilities concerning water and sanitation and provides some guidance for supporting the

Table 2

Main Disaster Risk Reduction and Management Frameworks Pertaining to Schools.

Creators & Audience	Aims & Focus	Format	Psychosocial Support?	WASH Support?
INEE Minimum Standards for Education: Preparedness Response and Recovery (2012)				
Developed by: Developed by: Inter-Agency Network for Education in Emergencies (INEE), Global Alliance for Disaster Risk Reduction and Resilience in the Education Sector (GADRRRES), and UNISDR Audience: Governments; Policymakers; Education Institutions; Practitioners; NGOs.	Foundational tool used by the Global Education Cluster, which is co-led by UNICEF and Save the Children. Ensures quality education response. Ensures populations affected by disaster or conflict have the right to life with dignity and to safe, quality and relevant education. Recognises the capacity of schools to support their pupils and communities beyond their function as educational institutions (e.g., spaces for social engagement, participating in society, shelter). Advocates for the promotion of schools as community centres, arguing that schools symbolise hope.	5 Domains: 1. Foundational Standards 2. Access and Learning Environment 3. Teaching and Learning 4. Teachers and Other Educational Personnel 5. Education Policy Domains consist of various standards; Total of 19 standards, each with accompanying key actions and guidance notes.	<input checked="" type="checkbox"/> Yes. See (e.g.), Access and Learning Environment domain. <input checked="" type="checkbox"/> The terms 'mental health', and 'psychological' appear only twice but 'psychosocial' appears throughout.	<input checked="" type="checkbox"/> Yes. See (e.g.) Access and Learning Environment domain. <input checked="" type="checkbox"/> The terms 'water', 'sanitation', and 'hygiene' appear throughout.
Worldwide Initiative for Safer Schools (2015)				
Developed By: GADRRRES and UNISDR Global government-led partnership.	To secure political commitment and facilitation or fostering of Safe Schools implementation around the globe. Provides technical assistance for governments interested in implementing the <i>Comprehensive School Safety</i> (CSS) framework (2017). Support Governments in developing national strategies for school safety as part of existing national disaster risk reduction or education plans.	Supports the CSS (2017) which consists of three components: 1. Safe Learning Facilities (disaster-resilient infrastructure). 2. School Disaster Management. 3. Disaster Risk Reduction and Resilience Education. Promotes 'Safe School Leaders' expected to make safe schools a priority as part of their national planning and education agenda.	<input checked="" type="checkbox"/> Not explicitly; by proxy through the CSS. <input checked="" type="checkbox"/> WISS is communicated over a series of webpages and documents. Concerning the development document: the terms 'mental health', 'psychological' and 'psychosocial' do not appear.	<input checked="" type="checkbox"/> Not explicitly; by proxy through the CSS. <input checked="" type="checkbox"/> Concerning the development document: the terms 'water', 'sanitation', and 'hygiene' do not appear.
Global Program for Safer Schools (2014)				
Developed by GFDRR. Audience: Governments; Policymakers; Ministries of Education.	To boost and facilitate informed, large-scale investments for the safety and resilience of new and existing school infrastructure at risk from natural hazards, contributing to high-quality learning environments. Complimentary to the CSS.	Roadmap for Safer and Resilient Schools (RSRS) supports the design of intervention strategies and investment plans to make schools safer and resilient at scale.	<input checked="" type="checkbox"/> Yes. RSRS explicitly notes hazards alter children's social and emotional wellbeing. <input checked="" type="checkbox"/> However, the terms 'mental health', 'psychological' and 'psychosocial' do not appear.	<input checked="" type="checkbox"/> Yes. RSRS explicitly states that water and sanitation are safety concerns. <input checked="" type="checkbox"/> However, the terms 'water' and 'sanitation' appear only twice; 'Hygiene' does not appear.
Comprehensive School Safety Framework (2017)				
Developed by GADRRRES and UNISDR. Audience: Governments; Policymakers; Ministries of Education; DRM and DRR Agencies.	To develop a strategic framework and guiding tools to support governments, education and DRR practitioners in integrating DRR as part of school curricula. To develop educational safety initiatives at the national and local levels.	3 Pillars: P1. Safe Learning Facilities. P2. School Disaster Management. P3. Risk Reduction and Resilience Education.	<input checked="" type="checkbox"/> Yes, but not explicitly; e.g., CSS provides some guidance for developing 'social cohesion' and building a 'culture of peace'. <input checked="" type="checkbox"/> However, the terms 'mental health', 'psychological' and 'psychosocial' do not appear.	<input checked="" type="checkbox"/> Yes. Pillar 1 explicitly adopts SDG 6 (Clean Water and Sanitation). <input checked="" type="checkbox"/> The terms 'water', 'sanitation' and 'hygiene' appear throughout.
ASEAN Common Framework for Comprehensive Schools Safety (2016)				
Developed by: GADRRRES specifically for the Southeast Asian context. Audience: Governments; Policymakers; Ministries of Education; National DRM and DRR Agencies.	To enhance school safety against the adverse impacts of natural and man-made hazards for the ASEAN nations. Intended to adapt the CSS (2013) for implementation in the ASEAN region.	Same pillars as CSS.	<input checked="" type="checkbox"/> No. <input checked="" type="checkbox"/> The terms 'mental health' and 'psychosocial' appear once; 'Psychological' does not appear.	<input checked="" type="checkbox"/> No. <input checked="" type="checkbox"/> The terms 'sanitation', and 'hygiene' appear only thrice; 'Water' does not appear.

psychosocial wellbeing of children by ‘developing social cohesion, and a culture of safety and resilience’ (p.5). While the CSS explicitly considers WASH, it only briefly considers psychosocial support. The ACFCSS is intended to be a comprehensive adaptation of the CSS fit for implementation in ASEAN schools. Yet, it does not itself sufficiently consider psychosocial or WASH support, or explicitly link back to the CSS for these matters (e.g., as the WISS does concerning both psychosocial and WASH domains). Given that psychosocial and WASH support is missing in the region-specific version of the CSS, the ACFCSS framework cannot be considered comprehensive. Given our focus on ASEAN region schools this paper will focus on adapting the ACFCSS framework to make it more comprehensive.

The ACFCSS commits to periodic review every three to five years; this paper argues revisions should prioritise the (re)inclusion and discussion of psychosocial and WASH support. In addition, none of the CSS-related frameworks (i.e., CSS, ACFCSS, WISS, GPSS) consider the role of schools beyond their capacity as educational institutions, though the INEE MS does. This paper argues revision of the ACFCSS should improve the current CSS framework by addressing this limitation and considering the role of schools beyond their capacity as educational institutions (e.g., as community centres). In consideration of the previously reviewed frameworks, this paper subsequently presents a fourth pillar that can be implemented into the ACFCSS. This fourth pillar combines psychosocial wellbeing and WASH in education to benefit school settings; both of these elements are integral to ensuring safe and resilient schools, and a positive learning environment for children, which promotes wellbeing.

4. Building wash and psychosocial support into the ACFCSS with a fourth pillar

To adapt the ACFCSS into a comprehensive framework, we first highlight the need to reintegrate all original CSS components. This includes advocacy for sustainable WASH provisions. This can be implemented through green school practices and community engagement in construction (see also, [100,101]). As the CSS only briefly considers psychosocial wellbeing, we argue the ACFCSS further develop its considerations for this domain explicitly. GPSS [102] explicitly considers psychosocial risk and need in DRM contexts, despite also being developed from the CSS. This supports the notion that incorporating psychosocial elements is essential; doing so in a new edition of the ACFCSS would help fill in the current gap.

The CSS aims to achieve ‘Learning Without Fear’ and ‘Schools as Zones of Peace’; the ACFCSS should retain these aims as they are well documented to support psychosocial wellbeing. For example, fear-free and peaceful environments are indispensable in protecting children and youth (e.g., see [35,103–105]), and are also beneficial to teachers who are also exposed to the potentially traumatic hazards themselves (see Ref. [34]). ‘Schools as zones of peace’ may provide an invaluable ‘buffering effect’ [106] of trauma-related stress symptoms, as these institutions facilitate social support by providing their community members a space to engage and interact informally. Beyond their capacity as educational institutions, schools can be enriching and restorative public spaces that present opportunities for informal learning, employability

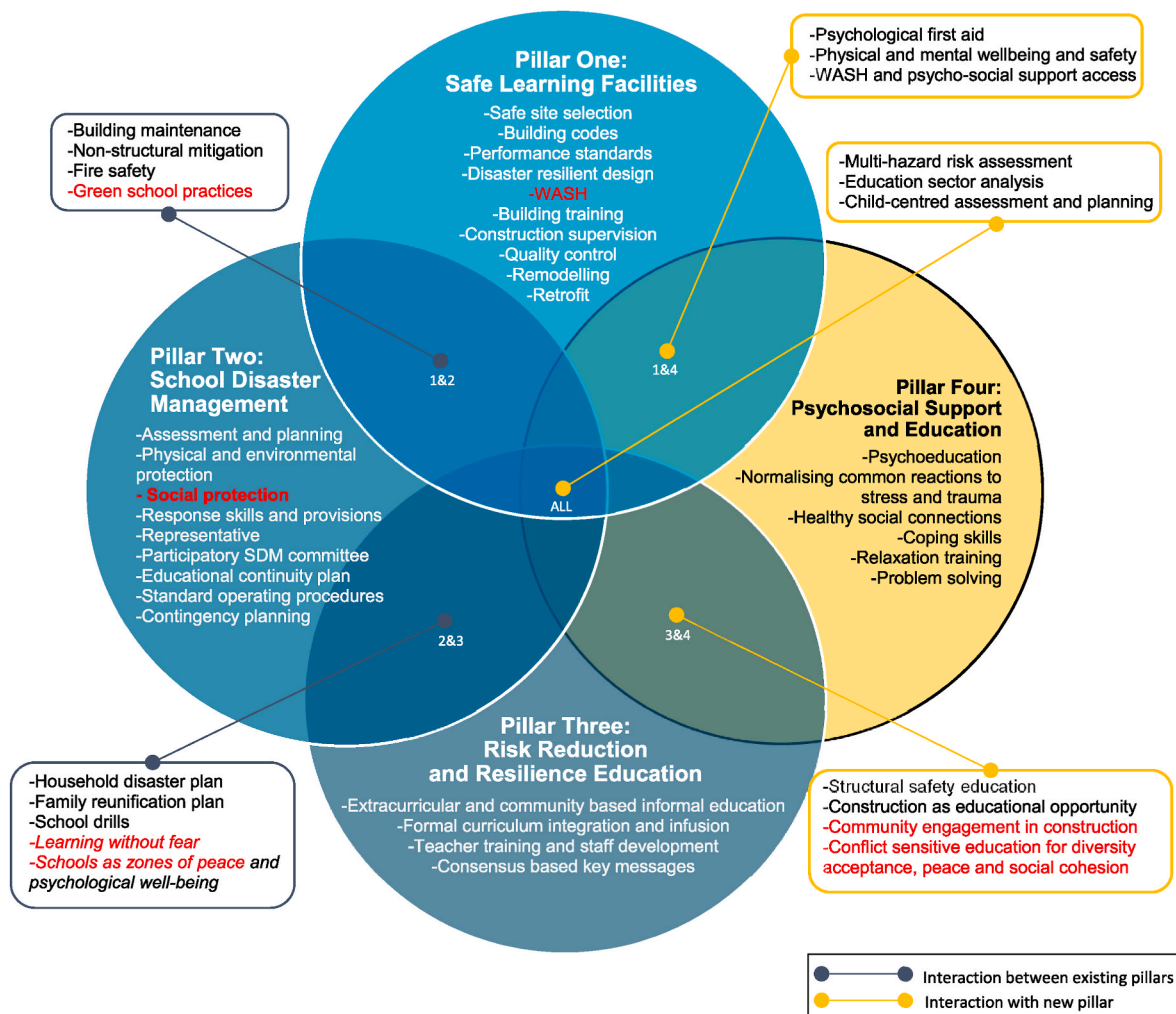


Fig. 2. Adapted ACFCSS with the proposed pillar 4 to integrate WASH and psychosocial support.

and contribute to shaping the collective identities of their communities [107,108]. Building on the existing evidence, we propose that a fourth pillar be added to the ACFCSS to explicitly integrate psychosocial wellbeing. Fig. 2 illustrates a revised ACFCSS framework which integrates these recommendations; red text indicates guidance that appears in the CSS but not in the ACFCSS, which we propose should be reincluded in the ACFCSS.

We further recommend that the ACFCSS consider the implementation of all of its Pillars throughout the DRM cycle (see Fig. 3). Employing and upholding DRM practices at all stages would contribute to the capacity of this framework in serving ASEAN school communities from an interdisciplinary and evidence-based foundation. For example, the pre-disaster Phase 1 is an ideal period when school-based interventions can work to improve WASH awareness, services and use, such as through education-based behaviour change campaigns about best WASH practices. This period should also include a focus on improving the psychological resilience of children and communities by promoting access to psychological support services and education-based programs, which better prepare school communities for overcoming the psychological impact of natural hazards (see also recommendations from Refs. [109,110]). We emphasise that efforts at every stage should also be shaped by what is learned following new hazard events, making the process iterative. Since the ACFCSS informs school practice, we highlight that revisions are urgent given that children are made vulnerable by the omission of WASH and psychosocial support considerations in this framework.

5. Towards an integrated approach to DRM and resilience-building through schools

This paper has reviewed how major frameworks for DRM and resilience-building consider psychosocial support and WASH, including in the *Sendai Framework*, the *Hyogo Framework*, the *Sphere Handbook*, *AADMER* and *JSPADM III*. We emphasise that children are especially vulnerable where their psychosocial and WASH needs are concerned and we have therefore also reviewed the major education and school-specific frameworks, such as *INEE MS*, *CSS*, *WISS*, *ACFCSS*. This review has revealed that these frameworks do not provide adequate consideration of psychosocial and WASH provisions, though some acknowledge these provisions are central to DRM and resilience-building. As the focus of these frameworks primarily concerns ‘safety’ and the role of schools in providing safe spaces for their pupils and surrounding communities, we argue that the notion of ‘safety’ should encompass both psychosocial and physical aspects. Since WASH is directly linked to psychological wellbeing because of the unique role of these provisions in the everyday lives of individuals, both WASH and psychosocial wellbeing must feature prominently in DRM. Considering that schools inherently provide a gateway to support children and their communities, the vast omission of psychosocial support in school-based disaster risk management frameworks is a severe limitation. Comprehensive frameworks should include strategic plans for providing adequate and timely psychosocial support, especially for children.

6. Conclusion

This paper has sought to build on and address gaps in the ACFCSS, which guides disaster risk management efforts in ASEAN schools and serves as an example of how the CSS may be adapted for use in schools globally. We have pointed to the potential advantages of these changes to ACFCSS for fostering resilience in children and their communities. Our intent is not to disregard the vital efforts of the ACFCSS, but support future dialogue and suggest amendments to make DRM frameworks interdisciplinary. DRM and resilience building for children involves complex challenges; addressing these challenges requires a holistic approach which integrates both the physical infrastructure and psychosocial interventions. In the case of the ACFCSS, the key suggested

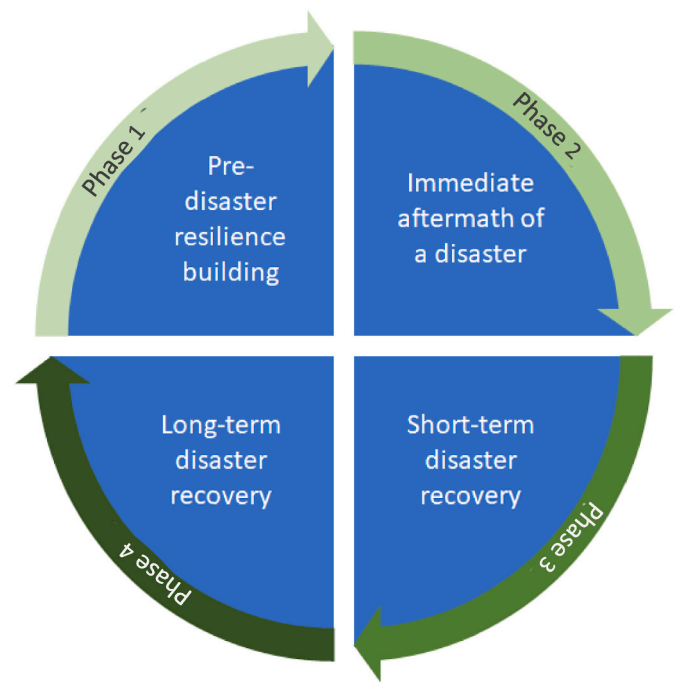


Fig. 3. Four phases of disaster risk management: A guide for ACFCSS implementation.

revisions are to add a fourth pillar that addresses the psychosocial needs of pupils, children and communities, and to integrate WASH into Pillar 1, as it appears in the CSS framework but not in the ACFCSS. We have demonstrated that DRM frameworks lack emphasis on psychosocial wellbeing and WASH and argued that these two domains are linked: access to adequate WASH provision may protect psychosocial wellbeing and promote community resilience. Schools are uniquely situated to support both the psychosocial and WASH needs of children; beyond their capacity as educational institutions, schools can act as community centres, which provide residents with a physical and social space to connect and interact, thereby providing informal social support and building a sense of togetherness. Our guidance would allow the ACFCSS to be brought into better alignment with the major international disaster risk recovery and management frameworks. A holistic framework would allow schools to become potential hubs for resilience building in preparedness and recovery phases. This would support resilient recovery and delivery of the UN Sustainable Development Goals by improving physical and psychosocial wellbeing of children. Though we have focused on the ASEAN region and the ACFCSS, this paper can inform efforts to improve DRR and DRM frameworks globally. For example, as the global consultation process for the newest iteration of the global CSS Framework (2021–2030) is currently underway, researchers and practitioners involved in implementation are encouraged to apply the insights highlighted in this paper in evaluating and maximising the comprehensiveness of these DRM frameworks - especially in region-specific adaptations and adaptations that exist to safeguard vulnerable populations. Other regional and global frameworks should draw on the provided insights to address underlying deficiencies, lest they become the foundation for any future adaptations.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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